ISO TC184/SC4/WG10 STEP Modularization PWI
Charleston SC, USA - November 18-20, 1998
Meeting Minutes

Wednesday, November 18, 1998

Attendance included Dave Price, Julian Fowler, Bernd Wenzel, Jochen Haenisch, Greg Smith, Allison Barnard Feeney, Yoshihito Kikuchi, Kazuo Ohkoshi, Yasumasa Oku, Guenter Straub, Dave Sanford, Chris Vaughan, and Rogerio Barra.

The pre-announced agenda for the meeting included:
- Review updates to guidelines documents for use by early SC4 modularization projects;
- Review of sample modules and APs and Ship Common Model Building Blocks;
- Review of proposed development and validation processes;
- Prepare for potential San Francisco SC4 meeting resolution allowing selected project to adopt a modular approach.

In reviewing the agenda for the meeting, it was agreed to add discussion of the new forms of ISO documents. A second item of additional requirements from Guenter Staub was also added. The timeline details were reviewed and adjusted as necessary.

Application Module Content Guidelines Review - WG10/N200
- The scope statement was reviewed and accepted. Items declared out of scope were reviewed to ensure that necessary items are addressed in some other appropriate document.
    1. ISSUE: In this context, Guenter points out that the reuse of mapping tables needs to be accommodated in one of the procedure guidelines.

- The application overview was accepted. There were no comments seen on this since the last meeting.
    1. ISSUE: For the moment, it was agreed to keep the term “common resources” as the source of the module interpreted model (MIM). It was noted that Common Resources is the name of WG12.
    2. ISSUE: Jochen asked about the inclusion of test procedures. At least test purposes could be included. A section discussing testing should be added to this document.

- In reviewing the proposed table of contents
    1. ISSUE: Shall the term ARM be renamed to MRM to be consistent with MIM.
    2. ISSUE: It was agreed that the long form should be omitted. It was agreed that the algorithm for long form generation is well defined in Part 11.
    3. ISSUE: Should the content include a section on fundamental assumptions? If so, it might include a summary of the UOFs in and present a natural language summary exposition of the context. A review of the use of this type of clause in other documents will be made.

- In discussing normative references:
    1. Require a reference to ISO 8824-1 addressing registration systems.

- In discussing the information requirements
    1. ISSUE: Shall the declarative statements be made separate paragraphs.
    2. ISSUE: Shall the form of the sentences be changed to direct instructions – i.e. In the first paragraph, include ...
    3. ISSUE: In section 4.5, add an article to the head of title for consistency.

- In discussion of UoFs
    1. ISSUE: How recursive shall the list of included modules be? The answer is this need not exist. The catalog and framework supporting modules will accomplish this.
    2. The new paragraph on listing the used application objects in referenced AMs was discussed and accepted.

- In discussing referenced application module ARMs,
    1. ISSUE: Shall we employ USE or REFERENCE in the EXPRESS? Shall the schema be REFERENCEd and the instantiable objects in it then USEd?
    2. ISSUE: The word “Referenced” shall be changed to “Required” in the title and the figure caption because of conflict with the privileged EXPRESS term REFERENCE.
    3. ISSUE: How shall the ARM EXPRESS deal with the issue of management resource type AMs. This is related to the outstanding issue of dealing with extensible SELECT TYPE. A consistent approach to a work around for this issue should be ensured.

- In discussion of application objects as ARM entity definitions
    1. ISSUE: Allow the use of derived attributes.
    2. ISSUE: Allow local rules in entities and types.
    3. ISSUE: Related to ISSUE 1. Can derived attributes be mapped? This needs research.
    4. ISSUE: Add a note to discourage the use of rules which only prevent reusability. This statement should be as strong as editorially possible.

- In discussing the ARM functions
    1. ISSUE: Shall a declaration be included when appropriate that no functions are present in a given ARM? ISO guidelines preclude the use of empty clauses. This suggestion is rejected for now.

- In discussing section 4.6
    1. ISSUE: Explicitly call out the MIMs that are USED, not just a general reference to the other AMs. Also in section 5.3.2.1.
    2. ISSUE: What value does the last sentence add? It doesn’t seem to fit. It seems to be an artifact of cut and paste.

- In section 4.6.1, it was noted that the title has been changed from mapping table to mapping specification.
    1. ISSUE: Can this document not refer to a mapping table anywhere and allow only the process document to discuss mapping table? This document would discuss a natural language generalization called a mapping specification.

- In discussion of section 4.6.2
    1. ISSUE: Issue 1 from section 4.6 is also applicable here. This is seen is several portions of this section.

- In discussion of section 4.7 on Annexes
    1. ISSUE: The list feature in the HTML file is displaying in a compressed manner in Netscape. This should be investigated for all lists. An error in the HTML tags was noted.
    2. For the ARM EXPRESS-G, shall we change the guidelines for this section to allow a more informative model?

- In discussion of clause 5.1
    1. ISSUE: What is the distinction on type of information and type of data? This will be verified against Part 1.

- In section 5.1.1
    1. ISSUE: The term “same scope” should say the “exactly the original scope”.
    2. ISSUE: In naming Application Objects, Guenter objects that first come first serve is not an adequate harmonization of names. One suggestion is that the AM Process Guidelines caution developers against using overly general names in specific. The extreme example would be that all AM names were automatically generated, and renamed in APs. Dave Sanford suggests that all AMs be assigned a unique short mnemonic prefix to be used in all names. This remains a serious issue.
    3. ISSUE: Improve the syntax in: “The use of words such as 'and', 'with' or 'also' in either the name or description of an AM is an indication that there is more than one concept being represented.”

- In section 5.2.2.
    1. ISSUE: Remove the statement on requiring a certain order to attributes. Changing the order may well effect readability of the entity.

- In section 5.3.4.2 and 5.3.4.2.2
    1. ISSUE: Does this section accurately reflect interpretation practice? This needs to be researched in the source document on AP content.
    2. ISSUE: Add discussion that allows specialization of used MIM constructs, not just IR constructs.
    3. ISSUE: If we allow redefined textual definitions without subtyping, it may become confusing as AMs are reused. There should be one textual definition with each type definition.

Thursday, November 19, 1998

There were no further comments on the AM Contents document and work started on the Application Protocol Content Guidelines.

Application Protocol Contents Guidelines Review (Using Application Modules) WG10/N201

- In reviewing figure 1 listing the contents of an AP
    1. ISSUE: Why is different between 4.3 and 4.4? It seems that section 4.3 will be removed and combined with 4.4.
    2. ISSUE: Why is the word “between” used in the title to section 4.3? Are these only constraints between them, or does it include constraints within a single used AM.
    3. ISSUE: Can an AP be configured in such a way that an AP is reusable in the sense that an AM is? To this end, the AP Content Guideline might start with the AM Guideline and add only the differences. If this is done, then creating an AP as we think of it now becomes creating a combined AM and then a small trivial document to add only a few remaining items. This idea is accepted and will be pursued.

Having accepted the results of ISSUE 3, the AM document was completed yesterday, and the portions of the AP that will be left for the AP are identical to those in the current AP document.

AP = Application Modules + (Abstract Test Suites + Conformance Requirements + Application Activity Model + Industry Specific Terminology + Conformance Class)

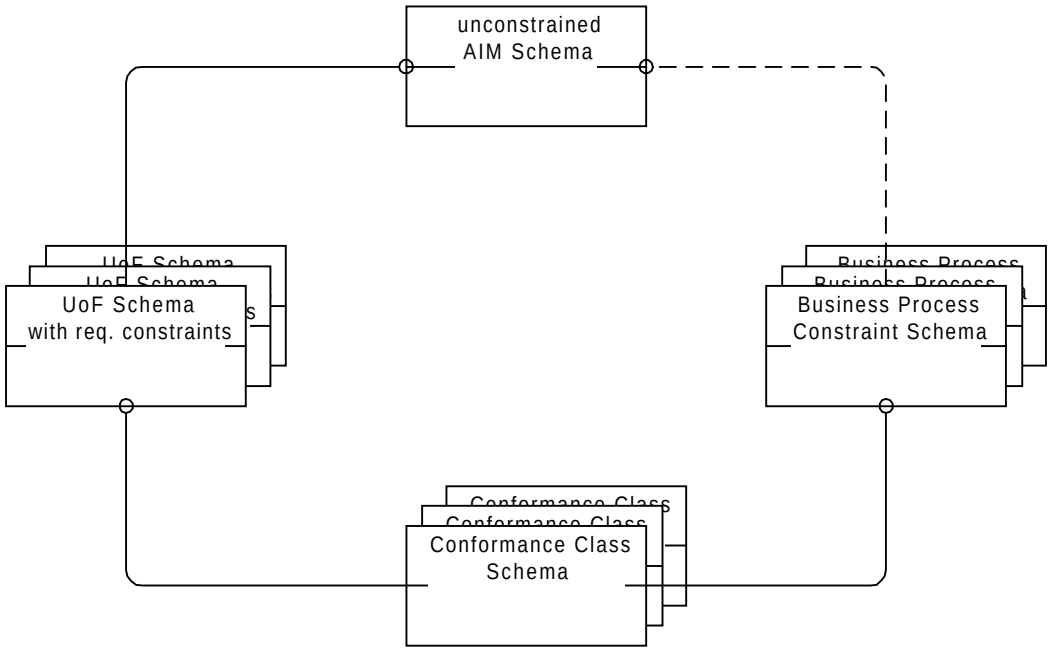
The Application Module is a reusable data specification. The remaining clauses to be put into the Application Protocol state how that specification is be used in a particular industrial domain.

ISSUE: To maximize reusability, it is suggested that AMs be published as two AMs - one with constraints and one without constraints. This is based on the assumption that rules can be added but not removed from USED schemas. This leads to a discussion of whether or not deletion should be allowed. Julian suggested that they might be omitted in stating conformance class, much as entities are deleted. The conclusion of the meeting is that omissions of any kind will not be allowed for new AMs. Omission would frustrate the intent behind AMs. AMs combine in their entirety to form new AMs. An open question remains about treating existing APs and is left for case by case treatment.

ISSUE: What can be done to align APs AMs and conformance classes? This led to a lively debate. If we combine AMs to make APs, why can’t the lower level AMs be APs. If this is done, then there would be a conformance class in these smaller APs. The new architecture of AMs allows the more atomic APs and this will be encouraged, but cannot be required.

Bernd Wenzel presented the following diagram to formalize the use of existing APs in developing AMs and AM based APs. This was discussed and will be continued in the future.

Fomalization of AP-Reuse



Guenter Staub now presented a paper on a number of requirements for AP modularization. His presentation will be included on the project server as WG10/N207. These are additional requirements to previously known requirements for modules.

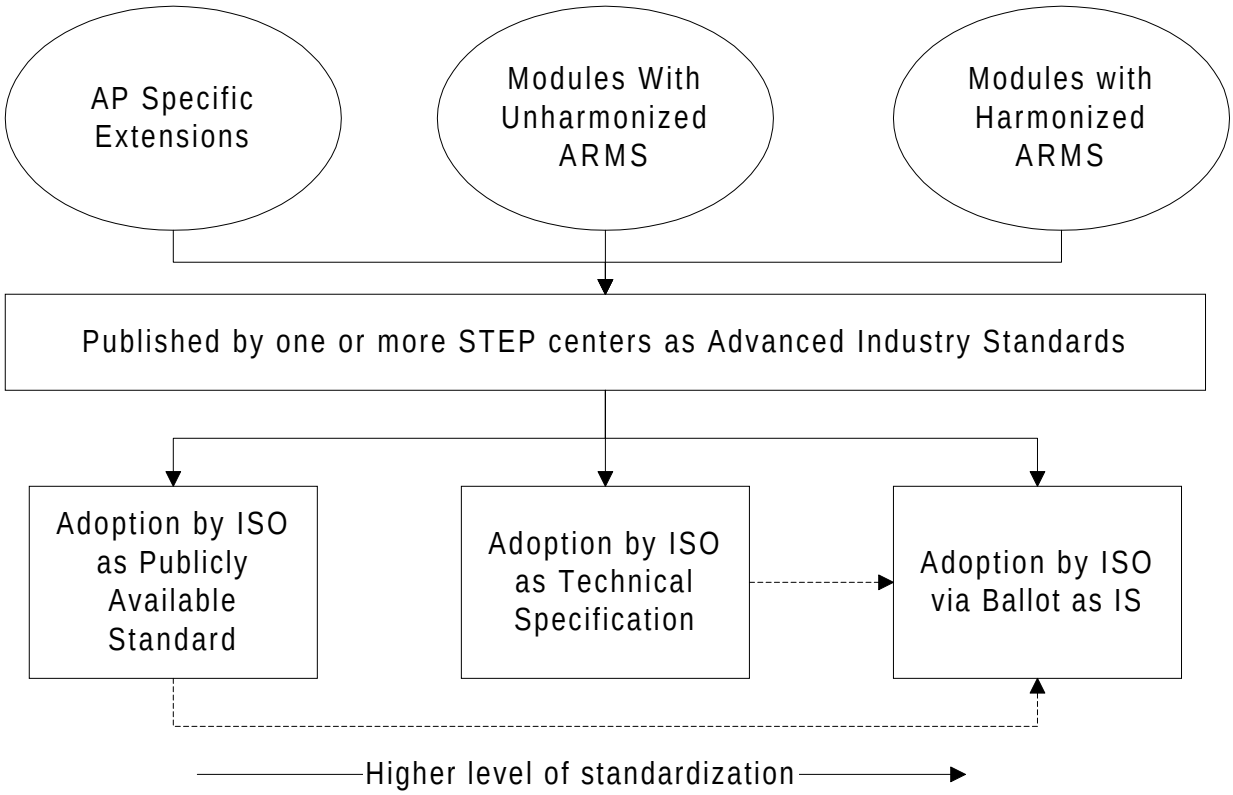
- Stability of Modules – Modules once published shall remain valid. Versions of modules are also required, but older versions must remain available for reference.
- Relationship required for modules that have an overlap in scope. The relationship should be formal and captured in the EXPRESS models – i.e. be computable.
- The module development process shall take into account and support an independent development process of modules.
- The modules should resist extension and modification.
- Module development needs to be guided by a framework.
- Framework shall play a central role in the process of developing modules and APs.
- The target should be to have one framework.
- If two or more frameworks exist, then there shall be a formal computable relationship between them (a integration framework).
- There shall be a formal relationship from the module to the framework.
- The framework needs to be extensible.
- The framework needs to be a formal ISO standing document.

- There is a need for a formal requirements document
- An Implementation Guidelines document for the modular approach is needed.
- A transition plan between existing APs and AM based APs
- Include requirements previously reported in WG10/N183.

The next agenda item is discussion of the AP/AM development process. A number of IDEF-0 diagrams were reviewed. A marked up copy of these diagrams was maintained and a corrected copy will appear on the project server.

The next discussion addressed what in the new AM process needs to be standardized, and what does not.

- In addition to AMs and APs, the concept of an extension is defined. It is an AIM like schema with a usage guide and example file. An example domain is colors and layers. This concept is modular in nature if not in name. These are similar to an older suggestion from Julian Fowler in which AMs would contain a Usage Guide to facilitate its use in APs.
- The diagram below was presented by Dave Price and discussed with general acceptance. Several additional related slides are now available as WG10/N207.



- Julian introduced a set of diagrams available at http://www.iso.ch/presse/newprod.htm. This URL addresses the nature and the process for generating the new types of ISO documents. It now seems that the lower left box in the above diagram should refer to an Industrial Technical Agreement (ITA) instead of a Publicly Available Standard (PAS).

In response to the above, WG10 drafted the following resolution with the hope that it would be completed and formally submitted to SC4 by PDES Inc., subsequently reviewed by various countries over the next several months, and then brought forth for discussion in SC4 at the San Francisco meeting.

Introduction:

The motivation for this resolution is to encourage the development, validation and deployment of reusable STEP capability in industry prior to submission to the ISO standardization process. The development of these reusable STEP capabilities is to be based on the guidelines and processes as defined and supported by the WG10 STEP Modularization PWI. As these guidelines and processes become stable, responsibility for them will be migrated to the appropriate SC4 organization.

The documents referenced in the resolution, including definitions of terms, the guidelines and the process proposals, are available at the WG10 STEP Modularization PWI web site http://wg10step.aticorp.org.

Objectives:

1) Encourage projects to adopt a modular approach to AP development

2) Enable the standardization of AMs, and of APs based on AMs developed as part of an AP development project

3) Enable the standardization of AMs that are not part of a larger AP development project

4) Enable the reuse of all or part of existing APs in extending the capability of STEP using the modular approach

5) Take advantage of the newly available ISO standards processes resulting in ITAs, PASs, and TSs to address standardization issues with respect to the modular AP development approach

6) Ensure adequate resources to complete the development and approval of the STEP modular approach in a timely manner

Resolution:

SC4 recommends that STEP projects adopt the modular approach as defined in the following deliverables of the WG10 STEP Modularization PWI:

- Guidelines for application module content
- Guidelines for the content of application protocol using application modules
- Industrial Framework Model
- Development process
- Overview of the STEP Modular Approach
- WG10 STEP Modularization PWI Issue Log

- Procedures for standardization of the components of the modular approach

  SC4 approves the standardization of the components of the modular approach as ITAs, PASs and/or TSs using the process defined by the WG10 STEP Modularization PWI.

  SC4 directs the WG10 STEP Modularization PWI to support these projects and continue the development of the required guidelines and processes until SC4 approves the documents and the supporting SC4 organizations are in place.

  SC4 requests that its members, liaisons and other organizations provide additional resources to support this effort.

Having completed discussion of the resolution, the workshop reviewed the open action items from the OSLO meeting of WG10.

- Propose combined framework: *Vaughan/Ishikawa*
  Disposition: This item remains open. Work shall be available for San Francisco.
- Update Issue Log: *Price* (mod spec, capture logic)
  Disposition: To be completed at this meeting.
- Summary of Joint ProSTEP/DIN NAM 96.4.4 Modularization workshop: *Staub*
  Disposition: This was presented at Beijing
- Document product, name, category, classification “modules”: *Haenisch, Price*
  Disposition: This item remains open. This will be completed for San Francisco.
- Document “specialization of module” via selection of possible OR mappings: *Staub*
  Disposition: This item remains open
- Minutes and document distribution: *Price*
  Disposition: This item remains open
- Update project schedule and deliverables: *Price*
  Disposition: An update was presented at Beijing
- Ship Common Model input into modules/harmonization: *Haenisch, Price*
  Disposition: This item remains open
- Work on getting process industry input: *Teijgeler , Palmer, West*
  Disposition: Mark Palmer was unable to attend this workshop. This item remains open
- San Francisco briefing to SC4 - expectation management: *Price, All*
  Disposition: This work remains for Dave Price.
- Publish catalogue demo on web: *Vaughan, Price*
  Disposition: Web site is up. This is still in work. and will be completed in the next several weeks.
- Plan next workshop Nov, Dec, Jan : *Price, All*
  This is complete with the Charleston workshop as reported here.

Friday, November 20, 1998

An example AM was reviewed whose domain was 3D associative text.

- This module is of a form called an modular extension to an AP (or several).
- This example included discussion of known issues and problems with the rules in various existing APs. A discussion followed suggesting that existing APs may need to be revisited, and new APs use a new set of approaches which acknowledge that APs may be combined.

This would effect how rules such as the mandatory context, and mandatory representation types might change to require certain things, but not prohibit extension. This area needs a more focused and extensive review.
- The organization of the document should be closer to proposed standards for AMs.
- In a discussion of should ARM-less AMs be allowed, it seems to be a pragmatic approach. In this case, harmonizing the ARMs between AP202 and AP214 seems to be more trouble than it is worth. As we migrate over some long period of time to a world in which all implementation is based on AMs, this may be revisited to ensure that AMs have less variation of structure.
- The use of extensions should be allowed in the context that it is a pragmatic approach implying a need for future rework to become a more standard form of AM.

The second example covered a domain of geometric validation properties.
- The documentation is very similar in form to a conventional AM, but has not been widely reviewed outside of PDES Inc. and AP203. It is therefore, an extension and is not a completed AM.
- It is important that implementers understand the long term stability of extensions is not so likely as it is for completed AMs.
- The ARM is incomplete in the sense that it references schemas that do not yet exist. It is suggested that the USED definitions that are not here should simply be copied from AP214 or Part 41 or whatever source to complete. To help recognize the fact that we expect these elements to later move into AMs of their own, it is suggested that these items be defined in non normative ARM like schemas in the technical discussion of the extension.

Jochen Haenisch presented an overview of the Ship Common Model. This presentation is available on the WG10 server as WG10/N209.
- The ship common model defines the overlap between the several harmonized ship building APs currently in work.
- This uses a modular approach to AP ARMs called “building blocks”.
- Building blocks must be reused in their entirety – thus facilitating the eventual publication of the building blocks as AMs.
- Should it be required that abstract supertypes need to be mapped. There seems to be no benefit. Since some high level AMs may have only Abstract types, might such AMs have an ARM and no mapping table. This seems fine and defines a need for change in our AM interpretation processes and a change in AM content.

Julian Fowler made a presentation on AP217 / AP227 harmonization. That presentation is available as WG10/N217.
- These two APs have a large overlap in scope in the piping arena.
- AP227 deals with plant layout. AP217 deals with ship piping and there manufacture.
- Option 1 – A ship context usage guide for AP227
- Option 2 – AP 217 as an extension type AP which subsumes and extends AP 227. 1 man year additional effort.
- Option 3 – Perform a full modular rebuilding of AP217. The impact of this modularity would impact AP227 in a later revision. 1.5 to 2 man year additional effort.
- Option 4 – Complete AP 217 “as is”. This is 2 to 2.5 years work.

- No choice of options has yet been made. This is still a discussion item on the AP217 team.

The workshop reviewed the list of PWI deliverables.

- Identified at Beijing for delivery by year-end.
    - AM Content Guidelines *
    - AP Content Guidelines *
    - Development Process *
    - Validation Process *
    - Overview Presentations *
- Identified at Beijing for later delivery.
    - Framework *
    - Two sample AM suites
    - Example AP
    - Catalogue
    - SC4 Processes
    - Part 1 amendment
    - Impact papers: (Integrated Resources, Implementation methods, EXPRESS-X, EXPRESS R2, WG10 Data Architecture, implementers, and users)
- At this meeting we have added
    - Issue Log *
    - Standardization Process *
    - PWI Requirements document *
    - “Help Desk” for projects *

It is felt that new items plus the framework need to be added to the items planned for year-end to support the proposed San Francisco SC4 resolution (*). A review in light of what is already done and sources for remaining items suggests that this work can be completed by year-end.

In considering support for continued success, the following items were identified.
- Be prepared to defend in detail our request for additional support
- Complete the example AP
- Availability of an explicit migration plan

The meeting concluded with agreement to discuss the PWI Issue Log on the mail exploder.

Respectfully submitted,
Dave Sanford